CLAIMS

1. A peelable circuit board foil, comprising:

a metal support layer having a first and a second surface;

a conductive metal foil layer having a first and a second surface; and

an inorganic release layer disposed between and contacting the first surfaces of the conductive metal support layer and the metal foil layer, wherein the inorganic release layer consists essentially of a co-deposited admixture of a metal and a non-metal, and wherein the second surface of the metal foil layer is coated with a high temperature anti-oxidant barrier and has a surface roughness that is less than 0.05 microns RMS.

2. The peelable circuit board foil according to claim 1, wherein the second surface of the metal support layer is treated with the high temperature anti-oxidant barrier.

3. The peelable circuit board foil according to claim 1, wherein the roughness of the second surface of the conductive metal foil layer is less than 0.01 microns.

4. A dielectric peelable circuit board foil, comprising:

a metal support layer having a first and a second surface;

a conductive metal foil layer having a first and a second surface;

an inorganic release layer disposed between and contacting the first surfaces of the metal support layer and the conductive metal foil layer; and

a first crystallized dielectric oxide layer disposed adjacent the second surface of the conductive metal foil layer.

5. The dielectric peelable circuit board foil according to claim 4, further comprising a second crystallized dielectric oxide layer disposed adjacent the second surface of the metal support layer.

6. The dielectric peelable circuit board foil according to claim 4, wherein:
the inorganic release layer is less than 0.030 microns thick;
the metal support layer is between 10 and 75 microns thick;
the conductive metal foil layer is between 5 and 25 microns thick; and
the first crystallized dielectric oxide layer is less than one micron thick.

7. The dielectric peelable circuit board foil according to claim 4, wherein:
the inorganic release layer is less than 0.030 microns thick;
the metal support layer is between 30 and 70 microns thick;
the conductive metal foil layer is between 10 and 20 microns thick; and
the first crystallized dielectric layer is less than one micron thick.

8. The dielectric peelable circuit board foil according to claim 4, further comprising a high temperature anti-oxidant barrier disposed between and contacting the first crystallized dielectric oxide layer and the second surface of the conductive metal foil layer, wherein the high temperature anti-oxidant barrier is formed from a material effective to prevent any substantial oxidation of the conductive metal foil layer during pyrolysis and crystallization of the first crystallized dielectric oxide layer.

9. The dielectric peelable circuit board foil according to claim 8, wherein the high temperature anti-oxidant barrier is formed from palladium,

platinum, iridium, nickel, or alloys or compositions that include any combination of these metals.

10. The dielectric peelable circuit board foil according to claim 4, further comprising a
conductive metal electrode layer disposed adjacent to a surface of the first crystallized dielectric oxide layer that is opposite the conductive metal foil layer.

11. The dielectric peelable circuit board foil according to claim 4, wherein the metal support layer and conductive metal foil layer each comprise a metal selected from a group consisting of copper, copper alloys, nickel, and nickel alloys.

12. The dielectric peelable circuit board foil according to claim 4, wherein the first crystallized dielectric oxide layer is formed from a dielectric oxide that contains lead.

13. The dielectric peelable circuit board foil according to claim 4, wherein the inorganic release layer consists essentially of a co-deposited admixture of a metal and a non-metal selected from the group consisting of oxides, phosphates and chromates of the metal.

14. A method for fabricating a peelable circuit board foil, comprising:

forming a metal support layer and a conductive metal foil layer that are joined at first surfaces using an inorganic release material; and

coating a second surface of the conductive metal foil layer with a high temperature anti-oxidant barrier, wherein the coated second surface has a surface roughness that is less than 0.05 microns root mean square (RMS).

15. The method according to claim 14, wherein the coating of the second surface of the conductive metal foil layer also coats the second surface of the metal support layer with the high temperature anti-oxidant barrier.

16. The method according to claim 14, further comprising:
forming a crystallized dielectric oxide layer on the conductive metal foil layer.

17. The method according to claim 16, wherein the forming of the crystallized dielectric oxide layer uses one of a solution, a powder, and a powder suspension for coating with a material that is selected from the group consisting of lead zirconate titanate, lead lanthanum zirconate titanate, lead calcium zirconate titanate, lead lanthanide titanate, lead titanate, lead zirconate, lead magnesium niobate, barium titanate, and barium strontium titanate, the crystallized dielectric oxide layer further comprising optional additional small quantities of nickel, niobium, calcium or strontium.

18. The method according to claim 16, further comprising:
forming an electrode layer adjacent the crystallized dielectric oxide layer on the conductive metal foil layer.

19. The method according to claim 14, wherein the metal support layer and the conductive metal foil layer each comprise a metal selected from a group consisting of copper, copper alloys, nickel, and nickel alloys.

20. The method according to claim 14, wherein the inorganic release material consists essentially of a co-deposited admixture of a metal and a non-metal selected from the group consisting of oxides, phosphates and chromates of the metal.

21. The peelable circuit board foil according to claim 14, wherein:
the inorganic release material is less than 0.030 microns thick;
the metal support layer is between 10 and 75 microns thick; and
the conductive metal foil layer is between 5 and 25 microns thick.

22. The method according to claim 14, wherein:
the inorganic release material is less than 0.030 microns thick;
the metal support layer is between 30 and 70 microns thick; and
the conductive metal foil layer is between 10 and 20 microns thick.